REMARKS

Applicant hereby requests the withdrawal of the rejections in the Office Action and reconsideration of the application, in view of the following remarks.

The present application contains claims 1 to 26.

The Examiner rejected claims 1-6, 8-20 and 22-26 under U.S.C. 103 (a) as being unpatentable over Hugenburg (U.S. Patent No. 6,714,545), hereinafter referred to as Hugenburg, in view of Hung (US Patent No. 6,583,901), hereinafter referred to as Hung .

Applicant respectfully traverses the rejection. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

As discussed in the Response to Final Action dated February 17, 2006, the present invention, as claimed by independent claims 1, 16, 22, and 23, is directed to a communication network or a method for operating thereof. The present invention as claimed includes, *inter alia,* following limitations:

> [...] a plurality of access multiplexers, each access multiplexer operable to provide multiplexing of data packets from a plurality of end-users onto a sparse dense wavelength division multiplexed (S-DWDM) wavelength; the S-DWDM wavelength having an optical precision capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex (DWDM) wavelength plan used in a core network;

a photonic switch, coupled to the access multiplexers via fiber optic cable for carrying a plurality of S-DWDM wavelengths, and operable to switch the plurality of S-DWDM wavelengths into a DWDM signal for transmission; and [...]

Hugenburg describes a VDSL based broadband data communication network for utilizing ATM/IP to an end user PC, thereby allowing selectable bit rate delivery to the end users, with a Class of Service (COS) and Quality of Service (QOS) selection.

<u>Access Multiplexer</u>

Hugenburg 's reference numeral 28 in Figure 2 is a universal service access multiplexer (USAM). Hugenburg does not teach or suggest that the USAM multiplexes data packets from a plurality of end-users onto a sparse dense wavelength division multiplexed (S-DWDM) wavelength. As discussed below, as the numeral 40 in Figure 2 is clearly an electrical aggregation device, it should be apparent to a person skilled in the art that a DWDM over the cable 38 would be highly uneconomical.

Hugenburg at column 7, lines 38-41 reads: "A VDSL data network is provided that: [...] (2) <u>supports</u> two-way data services <u>over</u> high-speed fiber optics using SONET, Dense Wavelength Division Multiplexing, IP, ATM, and other transport systems;". Here, and throughout the disclosure, Hugenburg discusses in general terms the two-way data services being carried over possible networks in an OSI network layer model, as should be apparent to a person skilled in the art. It does not teach or suggest: a) multiplexing of data packets from a plurality of end-users onto a DWDM plan, or b) a photonic switch operable to switch the wavelengths into a DWDM signal for transmission.

Photonic Switch

Hugenburg 's reference numeral 40 in Figure 2 is clearly a router and aggregation device, which is an electrical device, see for example, column 4, line 48 to column 5, line 15. "In the aggregation device, each bit rate service is mapped to a range of virtual path identifiers/virtual channel identifiers (VPI/VCIs) (ATM layer) where each VPI/VCI range on the switch has a corresponding ATM contract for traffic shaping. " It may connect to the ATM switch via an optical cable 24, a person skilled in the art would readily appreciate that it is not a photonic switch as defined in the present application.

As discussed in the Response to Final Action dated February 17, 2006, the photonic switch of the present invention operates in optical domain, without the cost burden of O-E-O conversion. "Referring to FIG. 8a there is graphically illustrated the communications layers corresponding to a path through the network of FIG. 8 from access to core node. As can be seen from the graph of FIG. 8a, other than the Ethernet access portion, the entire traverse from access to core is in the optical domain. The transitions within the optical domain between λ, S-DWDM and DWDM are all effected using passive optical multiplexers and demultiplexers with amplification on a per wavelength or small group of wavelengths basis to offset loses." (page 55, lines 24 to 30). The architecture of the photonic switch has been described, for example, at page 65, lines 18 to 32, and in Figure 12. It should be apparent to a person skilled in the art that this is a non-blocking switch capable of switching any optical input port to any optical output port.

S-DWDM

As discussed in the Response to Final Action dated February 17, 2006, the

sparse DWDM as claimed in the present application, has been described, for examples, at page 42, line 12 to page 43, line 15; page 62, line 4 to page 64, line 23 and in Figure 10, 11. "Sparse-DWDM is so-called because, although the carrier wavelengths are relatively coarsely spaced in the access plant, they are generated with an optical precision, especially with regards to optical carrier frequency, so they can map straight across into the tight optical frequency constraints of the DWDM network." (page 21, lines 2 to 6). "The core node 16 and access multiplexers 12 are provided with multiple wavelength arrays of optical carrier sources, the outputs of which, though grouped in groups matching the S-DWDM wavelength allocation, are generated with enough precision in a centralized multi-lambda generator [...] to permit the concatenation of, or more accurately the interleaving of a S-DWDM signals to flow directly into the DWDM core-network side ports on the edge photonic switch 14" (page 42, lines 12 to 18). "[...] the optical carriers all have to be generated with DWDM-compatible wavelength precision. The wavelengths returned from the access plant have to be DWDM compatible." (page 43, lines 5 to 7). The mapping of S-DWDM into the passbands of DWDM "requires accurate wavelength sources so that each wavelength, [...] is in the approximate center of its respective passband, [...] thereby preventing undue attenuation by a wavelength filters and providing sufficient guard bands between the wavelengths." (page 62, line28 to page 63, line 2).

The advantages of mapping DWDM into multiple S-DWDM have been described as, for example: "to taper the per fiber capacity to a scaling more appropriate for the access, where a lower aggregate capacity may be required. The level of S-DWDM scaling can be adjusted to match the needs of the outside plant [...]. The S-DWDM/DWDM approach allows one DWDM fiber to feed multiple fully load fed access fibers, providing a fiber consolidation function [...]. In addition for sub-populated S-DWDM feeds (dark access wavelengths) the photonic switch can be used to provide further

concentration, across the entire S-DWDM access/DWDM trunk resources."(page 63, lines 4 to 22); and "to provide low cost, non temperature-controlled components in the access plant. [...] Because the optical carrier entering the network has to be very precise in optical frequency in order to pass through the optical switch and align (in the frequency domain) with the trunk-side DWDM filters, [...] the requirement for that carrier to be generated in the outside plant and/or customer premises can be eliminated, by the simple process of generating that optical carrier at a benign environment central location, in this case the edge photonic switch, and then distributing it out to the required customer premises or outside plant access multiplexer." (page 63, line 24 to page 64, line 10).

Hung, on the other hand, teaches dynamic channel allocation in an optical communications system. At column 7 line 64 to column 8 line 2, column 9, lines 2-6, column 17 lines 45-49, and 55-56, and throughout the disclosure, Hung does not teach or suggest "S-DWDM wavelength having an optical precision capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex (DWDM) wavelength plan used in a core network" as claimed by the present invention. In fact, Hung does not use the term "interleave" or similar terms in the disclosure. Furthermore, by stating "system control unit 1360 selects an idle channel to achieve maximum isolation with used channels, i.e., the channel is selected to have the maximum separation from channels in use." (column 9, lines 3 to 6) Hung actually teaches away from the present invention.

For at least the reasons listed above, the Examiner has failed to establish a prima facie case for non-patentability of Applicant's claims 1, 16, 22, and 23 under 35 U.S.C. 103(a). Withdrawal of this rejection is requested.

Dependent Claims

Applicant notes that the dependent claims are inventive at least by virtue of their dependencies.

Applicant further notes that the dependent claims of the present application have additional features which are not taught or suggested by Hugenburg or Hung.

Applicant therefore respectfully requests reconsideration and withdrawal of the obviousness rejection.

In view of the above comments and amendments, and having dealt with all of the matters raised by the Examiner, early and favourable consideration of this application on its merits is respectfully requested.

Respectfully Submitted,

Dallas F. Smith

Dallas F. Smith
Registration No. 34,074

DFS/XL

c/o GOWLING LAFLEUR HENDERSON LLP
160 Elgin Street, Suite 2600
Ottawa, Ontario
K1P 1C3
CANADA
Telephone: (613) 233-1781
Facsimile: (613) 563-9869